Bischofia javanica Blume

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Bischofia javanica Blume

Taxonomy and nomenclature

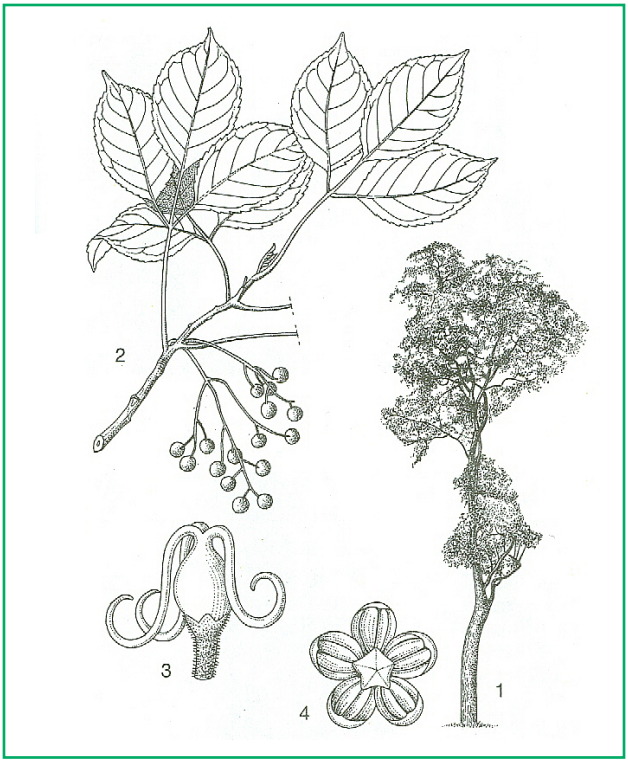
Species name: *Bischofia javanica* Blume
Family: **Euphorbiaceae**
Synonym(s): *B. cummingiana* Decne, *B. oblongifolia* Decne, *B. roperiana* Decne, *B. toui* Decne, *B. trifoliata* Hook, *Microelus roeperianus* Wight & Arn., *Stylodiscus trifoliastus* Benn.
Vernacular/Common name: Bishop wood, Java cedar, Toog tree (English), tuai (Filipino), bois de l'eveque (French), bhillar, kaen, kot semla, paniala, pankain (Hindi), akagi (Japanese), gintungan (Javanese),

Distribution and habitat

The tree is native to southern and southeastern Asia, Australia, and China. It has been introduced as a fast growing ornamental tree in East Africa, South Africa, and in the United States. It grows up to an altitude of 1800 m. The species is usually found scattered in primary and old secondary dry and deciduous forest or monsoon forest, occasionally in evergreen forest, swamp and teak forest. The tree thrives in moist, shady places such as river banks, swamps and ravines. Annual rainfall in its habitat varies from 1250-2500 mm; also capable of growing in dry places provided access to ground water. It tends to be evergreen in moist localities and deciduous in dry areas. The tree grows best in deep, loose soils such as sandy, rocky or loamy soils with sufficient water content, occasionally it is found on limestone. It can stand moderate shade and slight frost, but not drought.

Use

Wood is red, moderately heavy, hard, fine-grained and liable to wrapping and cracking. The timber is used for constructing bridges, house posts, pile foundation, sleepers, rafters, boats, dug-outs, wells, wheels, cheap pencils, packing cases and paper pulps. Pulp is suitable for paper. Bark yields tannins used in toughening of nets and ropes and a red dye used to stain rattan baskets. Fruits are used in wine-making. Seeds yield a drying oil useful in surface coating the product. Leaves are used as an astringent for toothache and eye diseases. The species also have anti-ulcer, antihelmintic and antidysentric properties. Young soft leaves are cooked and eaten as vegetables. The tree is also used as shade tree in tea, coffee and cardamom plantations.



Bischofia javanica Blume 1, tree habit; 2, fruiting twig; 3, female flower with calyx removed; 4, male flower. From Plant Resources of South East Asia 5(2).

Botanical description

B. javanica is a fast-growing, deciduous or evergreen tree with a large shady crown and shiny leaves attaining a height of 18-22 m and girth of 1.5-2.5 m with a straight cylindrical bole up to 9-12 m. Sometimes it is poorly shaped or with steep buttresses up to 3 m height. Bark is dark-grey, fairly smooth, fleshy, juicy and astringent inside, exfoliating in angular scales. Leaves are alternately arranged spirally, pinnately 3-foliate, glabrous; petiole 8-20 cm long; stipules oblong-triangular, papery, 7-22 mm long, early shed, leaflets elliptical to ovate, 6-16 cm long, 3-10 cm wide, base rounded to broadly wedge shaped, apex acuminate, margin finely crenate-serrate, pinately veined, shiny above, terminal leaflet long-stalked. Flowers are unisexual, actinomorphic, 5-merous, small, greenish-yellow, apetalous; disc absent. Male flowers in an axillary, many-flowered, 9-20 cm long panicle; sepals united at base; stamens 5, free, opposite to the calyx lobes; pistillode broadly peltate and short-stalked. Female flowers in a lax, 15-27 cm long panicle; calyx lobes 5, caducous; staminodes very small; ovary superior, globose, 3(-4) celled, with 2 apical pendulous ovules per cell, style short, with 3 long and spreading to recurved stigmas.

Bishofia javanica fruits.

Fruit and seed description

Fruits: Fruit is a globose berry, 1.2-1.5 cm across, reddish brown to bluish-black, with a horny to leathery pericarp and fleshy mesocarp; cells 3-4 seeded.

Seeds: Seed is light brown, smooth, ovoid to oblong with one rounded and two flat sides, embedded in colourless edible pulp. There are 60,000-100,000 seeds per kg.

Flowering and fruiting habit

B. javanica is dioecious, and minute flowers in pendulous clusters appear annually from 8 years onward. Time of flowering depends on the areas.

Location	Flowering	Fruiting
West Java	August-December	January-June with a peak in March
Central Java		May to November
East Java		November-December
India (depending on the areas)	April-May	September to January

Seed collection

Fresh fruits are collected from the trees by plucking the tip of small fruit-bearing branches, when the colour of the fruit starts to turn reddish brown and moisture content of seed is 10-20 %.

Processing and handling

Fruits are kept in shade for a few days to allow the pulp to rot. Then fruits are macerated over wire mesh and washed with tap water to separate the seeds from pulp. The seeds are then dried in shade.

Dormancy and pretreatment

Germination percentage is 75-100 % in fresh seeds. Seeds have no dormancy and therefore no pre-sowing treatment is required.

Storage and viability

Seeds of *B. javanica* can tolerate 5-6 % moisture content and seeds are not chill sensitive at subzero temperature, and therefore orthodox. Viability can be maintained for more than two years if stored at 4°C to -20°C with 5-7 % seed moisture content. Viability rapidly declined after 3 months of storage at ambient temperature (20-30°C); even at 15°C few seeds were viable after 6 months of storage. However, aerated moist storage of seeds (stored over water in closed box) can retain viability for two years at 4-10°C in ungerminated condition. Seeds should be treated by dressing with 0.2 % Bavistin used as fungicide before storage in high moisture content.

Sowing and germination

Seeds can be sown by broadcasting in irrigated field. About 70 g seeds will suffice for one m^2 bed. Beds are covered by thatch grass and watered regularly. Seeds can also be sown at a depth of 0.5-0.8 cm in lines made at 8 cm distance and 4 cm between seeds. Germination is epigeal. It starts after 10 days and is completed within a month. One or two year old seedlings are taken out with ball of earth for planting directly in the field (without transplanting seedlings in polythene bags). Seedlings need cool and overhead shade for better growth. Stump planting also gives better results. Direct sowing is generally not followed as seeds are washed away by rains.

Phytosanitary problem

Young trees are sometimes heavily attacked by top and twig-borers, causing failure of plantations in less suitable locations. Caterpillars of *Metanastria hyrtaca* and *Selepa celtis* feed on the foliage. The attack of the fungi, *Corticium salmonicolor* and *Glomerella cingulata* was recorded in Indonesia. The wood is susceptible to *Lyctus* spp. and dry-wood termite attack, longhorn and ambrosia beetles as well as wood-rotting fungi. *Pseudocercospora bischofiae* (Yamam.) Deighton, is a fungi, host-specific to bishop wood, causes serious damage to leaves of *B. javanica*.

Selected readings

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